

APPLICATION FOR LETTERS PATENT OF THE UNITED STATES

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Patricia Carthey

(Typed or Printed Name of Person Mailing Paper or Fee)

Patricia Carthey

(Signature of Person Mailing Paper or Fee)

SPECIFICATION

To all whom it may concern:

Be It Known, That we, PAUL C. BLANK and MARK E. KEETON, of LaCrosse,
WI and Kettering, OH, respectively, have invented certain new and useful improvements
in COLUMNAR ADHESIVE LABEL ROLL, of which we declare the following to be a
full, clear and exact description:

1

COLUMNAR ADHESIVE LABEL ROLL

2

3 BACKGROUND OF THE INVENTION

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5 [0001] The present invention relates generally to stationery products, and, more
6 specifically, to adhesive labels.

7 [0002] The ubiquitous adhesive label is available in a myriad of configurations for use in
8 various applications, including specialty applications. The typical adhesive label includes
9 pressure sensitive adhesive on its back side initially laminated to an underlying release liner.
10 The release liner is typically coated with silicone to provide a weak bond with the adhesive
11 for permitting the individual removal of labels from the liner when desired.

12 [0003] Adhesive labels may be found in individual sheets, or joined together in a fan-fold
13 stack, or in a continuous roll. Label rolls are typically used in commercial applications
14 requiring high volume use of labels.

15 [0004] More specifically, in the fast food industry specialty labels may be used in
16 identifying individual food products in typical sales transactions. The label roll may be
17 formed of thermal paper for sequential printing of individual labels in a direct thermal printer.
18 Or, a thermal transfer printer may also be used.

19 [0005] The typical pressure sensitive adhesive label includes full surface adhesive on its
20 back side which may interfere with the handling thereof during the food preparation process.
21 An individual label identifying the corresponding food product is removed from the printer
22 by the user who typically wears sanitary gloves. The label may inadvertently bond to the
23 gloves, and this increases the difficulty of placing the label on the packaging for the intended
24 food product.

25 [0006] Furthermore, the liner material used in the label roll results in waste, and
26 correspondingly affects the cost of the roll. Linerless label rolls are conventionally known in
27 which the front surface of the label web may be coated with a suitable release material, such
28 as silicone, for providing an integrated liner in the web itself without the need for an
29 additional liner sheet.

1 [0007] However, as the linerless web is unwound in the printer, the back side adhesive is
2 exposed to the various parts of the printer and can inadvertently bond thereto leading to
3 undesirable jamming of the printer.

4 [0008] Furthermore, the printer may include a typical cutting knife or cutting bar for cutting
5 individual labels from the continuous web. The exposed adhesive on the linerless label roll
6 therefore permits adhesive buildup on these cutting elements during prolonged operation of
7 the printer.

8 [0009] Adhesive buildup on any of the various components of the printer contacting the
9 adhesive side of the label is undesirable because it requires periodic cleaning or other
10 maintenance to avoid printer jamming, which may nevertheless occur.

11 [0010] Accordingly, it is desired to provide an improved linerless label roll.

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13 BRIEF SUMMARY OF THE INVENTION

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15 [0011] A label roll includes a web having front and back surfaces wound in a roll. The
16 back surface includes adhesive patches aligned in a column along the running axis of the
17 web. The front surface includes a release strip behind the column of patches and laminated
18 thereto in successive layers in the roll.

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20 BRIEF DESCRIPTION OF THE DRAWINGS

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22 [0012] The invention, in accordance with preferred and exemplary embodiments, together
23 with further objects and advantages thereof, is more particularly described in the following
24 detailed description taken in conjunction with the accompanying drawings in which:

25 [0013] Figure 1 is an isometric view of a thermal printer dispensing pressure sensitive
26 labels in an exemplary application.

27 [0014] Figure 2 is a side elevational internal view of the printer shown in Figure 1
28 illustrating exemplary components along the feedpath of the label roll mounted therein.

29 [0015] Figure 3 is a top view inside the printer illustrated in Figure 2 showing dispensing of

- 1 the label roll therethrough.
- 2 [0016] Figure 4 is a isometric view of the label roll illustrated in Figures 1-3 in accordance
- 3 with an exemplary embodiment.
- 4 [0017] Figure 5 is a back side view of the label roll illustrated in Figure 4 in more detail.
- 5 [0018] Figure 6 is a back side view of a portion of the label roll in accordance with an
- 6 alternate embodiment.
- 7 [0019] Figure 7 is a front side view of a portion of the label roll in accordance with an
- 8 alternate embodiment.
- 9 [0020] Figure 8 is a back side view of a portion of the label roll in accordance with an
- 10 alternate embodiment.

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12 DETAILED DESCRIPTION OF THE INVENTION

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14 [0021] Illustrated in Figure 1 is a conventional printer 10 configured for printing in

15 sequence individual labels 12 for use in an exemplary fast food application. For example,

16 food may be placed in a suitable food package 14 such as the paper box illustrated, or simple

17 wrapping paper (not illustrated).

18 [0022] Print or identifying indicia 16 is printed on the label in the printer for identifying the

19 contents of the package, for example. The individual printed label may then be removed

20 from the printer and applied to the food package 14 as illustrated in the exemplary method

21 shown in Figure 1.

22 [0023] Figure 2 illustrates certain elements along the feedpath of the printer 10, which may

23 otherwise have any conventional configuration, such as a direct thermal printer, or

24 alternatively a thermal transfer printer. A label roll 18 is suitably mounted inside the printer

25 either in a tray therefor, or on a support spindle extending through the center core thereof.

26 The roll includes a continuous, elongate web 20 spiral wound in a multitude of overlapping

27 layers or laminations.

28 [0024] The web 20 is dispensed from the roll inside the printer illustrated in Figures 2 and 3

29 along a suitable feedpath. The feedpath may include a pair of web guides 22 aligned

1 transversely with each other on opposite sides of the web for guiding the web as it is
2 dispensed through the printer. A platen roller 24 is disposed downstream of the guides and
3 suitably engages the web for pulling the web forward through the printer for dispensing.

4 [0025] Disposed above the platen roller 24 is the printing head 26 which may have any
5 conventional configuration, such as a thermal head assembly for use in direct thermal printing
6 of the web which may be formed of suitable thermal paper. Alternatively, a thermal transfer
7 ribbon ((not shown) may be used with ordinary printing paper for the web.

8 [0026] Disposed at the outlet end of the printer illustrated in Figures 2 and 3 is a suitable
9 cutting blade 28 which may have any conventional configuration. In the exemplary
10 embodiment illustrated in these Figures, the cutting blade 28 is rotatably mounted on a roller
11 for suitably cutting the web along a straight line across its full width during operation. In an
12 alternate embodiment, the cutting blade may be stationary, with the user simply tearing or
13 cutting the dispensed label along the blade in a typical manner.

14 [0027] The exemplary printer illustrated in Figure 3 also includes an index sensor 30 for
15 sensing a suitable index mark contained on the web, if desired. Index sensors are
16 conventional, and typically are optical components which detect a suitable mark on the web
17 for permitting precise cutting of the individual labels 12 for the intended size. The cutting
18 blade 28 is typically indexed with the platen roller 24 for coordinating the operation thereof.
19 In this way, the distance between the cutting blade and the index sensor 30 is known and
20 permits precise cutting of the web along the longitudinal or running axis 32 thereof during
21 operation.

22 [0028] The label roll 18 in the printer shown in Figures 1-3 is illustrated in more
23 particularity in isolation in Figure 4. The web 20 is preferably a single ply sheet of suitable
24 label material, such as thermal paper. The web includes a front or top surface 34 which is
25 mounted in the printer illustrated in Figure 2 facing upwardly for being printed by the printing
26 head 26. The web also includes an opposite back or bottom surface 36. The web is wound in
27 the roll 18 in a spiral having a multitude of overlapping layers or laminations in which the
28 back surface 36 is laminated against the front surface 34 of the upstream portions or inner
29 layers of the web.

1 [0029] The back surface 36 illustrated in Figure 4 includes a plurality of repeating adhesive
2 spots or patches 38 aligned in, and spaced apart along, a column extending along the
3 longitudinal running axis 32 of the web. The adhesive patches 38 may have any conventional
4 composition such as the typical pressure sensitive adhesive which may be formulated for
5 permanent bonding or temporary bonding to the intended surface, such as the package 14
6 illustrated in Figure 1. In the preferred embodiment, the adhesive patches 38 effect weak
7 bonds with the food package 14 to permit the repositioning of the individual labels without
8 tearing of the label upon being removed from a surface.

9 [0030] Instead of providing full surface coverage of the adhesive on the back surface 36
10 illustrated in Figure 4, the adhesive is provided solely in small patches in a relatively minor
11 area of the back surface, with the remaining major area of the back surface being devoid of
12 adhesive. In this way, the substantial reduction in surface area of the adhesive
13 correspondingly decreases the buildup of adhesive inside the printer illustrated in Figure 2 for
14 increasing the time between any maintenance required therefor.

15 [0031] As further illustrated in Figure 4, the front surface 34 of the roll includes a release
16 strip 40 which extends along the running axis directly behind the column of adhesive patches
17 38. The release strip may be formed of any suitable releasing material, such as cured silicone
18 or acrylic suitably coating or impregnating the web front surface. In this way, the column of
19 adhesive patches 38 may be laminated to the release strip 40 in the successive layers of the
20 roll illustrated in Figure 4 without the need for a separate liner. The single ply web wound in
21 the roll 18 is therefore linerless.

22 [0032] Accordingly, when the linerless roll is mounted in the printer illustrated in Figure 2,
23 the adhesive-less front surface 34 preferably faces upwardly to engage the web guides 22 and
24 the printing head 26 for preventing adhesive contact therewith. The adhesive back surface 36
25 faces downwardly and is suitably spaced from adjacent portions of the feedpath for
26 preventing inadvertent bonding therewith. The platen roller 24 is preferably coated with a
27 suitable non-stick material such as polytetrafluoroethylene, typically known by the Teflon
28 trademark brand material.

29 [0033] The non-stick platen roller 24 will therefore suitably drive or pull the web along its

1 feedpath in the printer to permit individual labels 12 to be cut therefrom at the cutting blade
2 28 disposed immediately downstream from the platen roller. Since the adhesive patches 38
3 cover a relatively small portion of the area of the back surface 36, buildup of adhesive on the
4 cutting blade 28 is correspondingly reduced, and limited to the small region aligned with the
5 adhesive patches. Periodic maintenance for removing any adhesive buildup is therefore made
6 easier, or adhesive accumulation may be insignificant within the life of the printer itself.

7 [0034] As shown in Figure 4, the adhesive patches 38 are preferably aligned parallel along
8 one lateral edge of the web 20, and closer thereto than to the opposite lateral edge of the web.
9 In this way, the adhesive is isolated along only one edge of the web, with the remainder of
10 the back surface 36 being devoid of the adhesive.

11 [0035] A particular advantage of the this columnar adhesive configuration is that most of
12 the individual label 12 as illustrated in Figure 1 is without adhesive and permits ready
13 handling thereof, even by users wearing gloves, with little chance of grabbing the adhesive
14 patch itself. The isolated adhesive patch may then be used for bonding the entire label to the
15 package 14, in a cantilever fashion for example, for permitting grasping thereof for removal
16 and repositioning of the label if desired.

17 [0036] In the preferred embodiment illustrated in Figures 3 and 4 for example, the web 20
18 is continuous along the running axis, and imperforate without perforations or die cuts. The
19 individual labels 12 may then be defined by the configurations of the adhesive patches 38 and
20 corresponding cutting of the labels by the cutting blade 28 illustrated in Figure 2.

21 [0037] In the preferred embodiment illustrated in Figures 4 and 5, the patches 38 are oval,
22 with major axes disposed parallel to the running axis 32. The patches are identical to each
23 other and repeat along the column thereof. The individual patches have convex leading
24 edges, convex trailing edges, and straight side edges extending therebetween.

25 [0038] A particular advantage of this configuration is the smooth transitioning of the
26 adhesive patches as they travel over the rotating platen roller 24 illustrated in Figure 3 during
27 operation. The adhesive on the convex leading edge of the patches transitions onto the roller
28 with increasing width, and then leaves the roller with decreasing width for distributing the
29 adhesive forces therebetween during operation.

1 [0039] In the preferred embodiment illustrated in Figures 4 and 5, the web 20 further
2 includes a plurality of repeating index or sensor marks 42 disposed between corresponding
3 ones of the adhesive patches 38 to define corresponding labels 12 each having a single
4 adhesive patch. The index mark 42 may have various configurations, such as the black line
5 which extends across the full width of the web in Figures 4 and 5.

6 [0040] During operation, the index mark 42 illustrated in Figure 4 is disposed on the web
7 back surface 36 and faces downwardly in Figure 3 toward the index sensor 30. As each index
8 mark passes over the index sensor 30 during operation, it is detected thereby. The computer
9 controller of the printer then ensures that the cutting blade 28 is coordinated with the
10 transport of the platen roller 24 for precisely cutting the web longitudinally between
11 successive adhesive patches 38 in this exemplary configuration.

12 [0041] The index marks 42 may be located at any longitudinal position on the web such as
13 between the adjacent adhesive patches, which permits the line marks 42 to provide the top
14 and bottom edges of the individual labels once they have been cut from the web.

15 [0042] Figure 6 illustrates an alternate embodiment of the label roll in which the adhesive
16 patches 38B are rectangular instead of oval. In this embodiment, the rectangular patches have
17 straight side edges aligned parallel with the running axis 32, and are closely adjacent to one
18 edge of the web. The rectangular patches also have straight leading edges and trailing edges
19 extending transversely or perpendicular to the running axis 32 of the web.

20 [0043] The rectangular adhesive patches 38B illustrated in Figure 6 are preferably elongate
21 along the running axis 32 and are taller or longer along that axis than they are wide transverse
22 thereto. In this embodiment, the corresponding index marks 42 are also used between the
23 adjacent rectangular patches 38B to define the corresponding labels 12, with each label
24 having a single rectangular patch. Like the oval patch 38 illustrated in Figure 5, the
25 rectangular patch 38B is aligned closely along only one edge of the web leaving the majority
26 of the remaining web adhesive-free.

27 [0044] In both embodiments illustrated in Figures 5 and 6, the release strip 40 is the same
28 and covers completely the web front side 34 in full. The silicone release coating of the full
29 area strip 40 protects the underlying printing formed in the thermal paper in the thermal

1 printing process.

2 [0045] Figure 7 illustrates an alternate embodiment for the release strip, designated 40B,
3 which is narrow and conforms in width slightly wider than the column of the adhesive
4 patches 38 illustrated in Figure 5, or with the column of rectangular patches 38B illustrated in
5 Figure 6 if desired. This leaves the remainder of the web front side 34 devoid or free of any
6 release material. This embodiment may be useful for thermal transfer printing in which a
7 transfer ribbon is suitably provided between the printing head and the exposed front surface
8 34 of the web to the side of the narrow release strip 40B.

9 [0046] Figure 8 illustrates yet another embodiment in which rectangular adhesive patches
10 38C are elongate transverse to the running axis 32 and are shorter in height along the running
11 axis than they are wide transverse to the running axis. In this way, a column of relatively
12 small rectangular patches may be used instead of the larger rectangular patches 38B
13 illustrated in Figure 6.

14 [0047] The embodiment illustrated in Figure 8 is preferably devoid of the index marks
15 between the small patches 38C for permitting variable label size if desired. For example, the
16 web 20 may include a plurality of the labels 12 defined therein, with each label having a
17 plurality of the small adhesive patches 38C.

18 [0048] The small patches increase the number of adhesive-free spaces between the patches
19 in which the web may be cut for defining the size of the individual labels 12. Preferably the
20 web is cut in the areas devoid of adhesive to reduce buildup of adhesive on the cutting blade.

21 [0049] In the various embodiments disclosed above, the small adhesive patches reduce the
22 area of adhesive, and correspondingly reduce the associated problems of the adhesive during
23 installation and operation of the linerless label roll in the printer. Reduced area adhesive
24 correspondingly reduces the portions of the printer subject to adhesive buildup. The
25 columnar alignment of the adhesive patches isolates any adhesive buildup to a minor portion
26 of the printer feedpath, and correspondingly reduces the required maintenance therefor.

27 [0050] The train of separated adhesive patches permits cutting of the labels in the
28 adhesive-free spaces for reducing adhesive buildup. And, if individual labels are cut along
29 the adhesive patches themselves, subsequent cutting of labels in the adhesive-free zones

- 1 provides a form of self-cleaning of the cutting blade.
- 2 [0051] While there have been described herein what are considered to be preferred and
3 exemplary embodiments of the present invention, other modifications of the invention shall
4 be apparent to those skilled in the art from the teachings herein, and it is, therefore, desired to
5 be secured in the appended claims all such modifications as fall within the true spirit and
6 scope of the invention.
- 7 [0052] Accordingly, what is desired to be secured by Letters Patent of the United States is
8 the invention as defined and differentiated in the following claims in which we claim: